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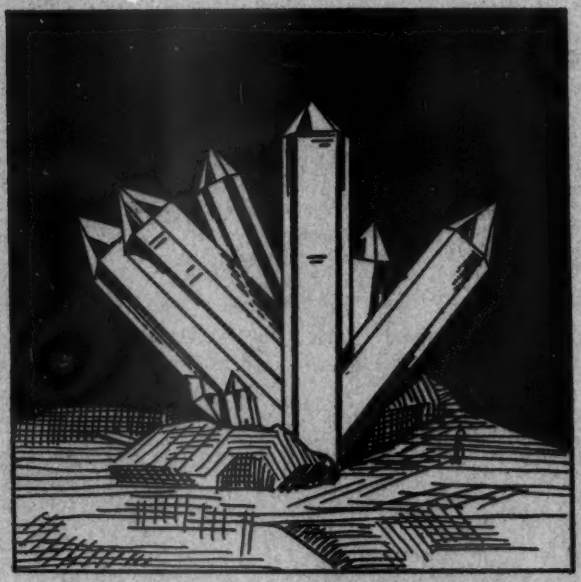
OL. 9, NO. 6

42

WHOLE NO. 36

ROCKS AND MINERALS

A Magazine For Mineralogist, Geologist & Collector



OFFICIAL JOURNAL OF

THE ROCKS AND MINERALS ASSOCIATION

UBLISHED MONTHLY

JUNE 1934

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Forms for the May issue will close April 15th.

WANTED: Correspondents in all parts of the world who will be kind enough to send us notes and news items on minerals, that they think may be interesting to the subscribers of ROCKS and MINERALS. Such as are available we shall be very glad to print in the magazine.

ROCKS and MINERALS

A MAGAZINE FOR MINERALOGIST, GEOLOGIST AND COLLECTOR

PUBLISHED MONTHLY ··· FOUNDED 1926

Volume 9, No. 6 **Whole No. 36**

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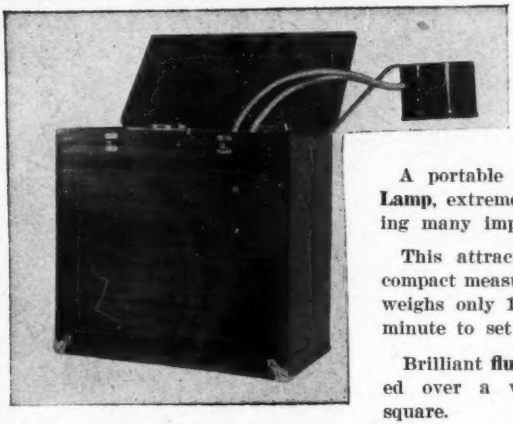
ROCKS AND MINERALS **PEEKSKILL, N. Y., U. S. A.**

The Official Journal of the Rocks and Minerals Association



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Edited and Published by Peter Zodac

PUBLISHED MONTHLY

The Official Journal *of the* Rocks and Minerals Association

JUNE 1934

VOL. 9, NO. 6

WHOLE NO. 36

Indexing Geologic Collections

By LLOYD W. FISHER, *Bates College*

Every college department of geology, large or small, and every mineral collector, novice or experienced, collects numerous specimens of minerals, rocks and fossils. The college department must necessarily have large and varied collections in hand if the students in the department are to become acquainted with the materials discussed in the lectures and textbooks. The private collector specimens will vary in amount depending on his location and his interests in the field of geology. But, regardless of the incentive in acquiring the collection, the specimens must be catalogued in some manner that will facilitate their handling and filing. The various methods of labeling geological specimens varies, of course, with the individual doing the labeling. Many persons and colleges follow the acquisition method of cataloguing specimens by number, that is, the first specimen in the collection is number 1, the second is number 2 and so on. The chief objection to such a method is in the fact that it very often places side by side entirely unrelated materials whether they be fossil, mineral or rock. The method of labeling and numbering specimens in the department of geology of Bates College is familiar to some, unfamiliar to others, but since it is a handy and reliable method it is presented to the readers of ROCKS and MINERALS. Space permits only a brief discussion on the essential features of the Bates method and readers will undoubtedly vary the system to fill their own individual needs. It is the hope of the author, however, that some help may be offered those collectors who are at a complete loss as to how their collection should be labeled.

ROCKS

The basic idea in the suggested numbering of rock specimens is influenced by the desire to have related rocks near each other in the filing cabinets. In the following system the writer does not boast of a complete system by any means—it is merely suggestive, and based first on mode of origin; secondly, on "blood" relationship; and thirdly, on acquisition sequence.

According to mode of origin, or, the three major rock families, the divisions are:

No. 1—All igneous rocks
No. 2—All sedimentary rocks
No. 3—All metamorphic rocks

And this method has a secure foundation in that erosive processes at work on the igneous rocks contribute the materials from which the sedimentary rocks are formed. Latter earth movements or injections of molten materials affect both igneous and sedimentary rocks and form the metamorphic rocks.

A second number is now placed after the 'origin' number. This number is based on the characteristics of the rock. Each of the above three major families has a different system of subdivision.

No. 1—All igneous rocks.

Intrusive rocks	*Extrusive rocks*
1—Granite	1a—Rhyolite, etc.
2—Syenite	2a—Trachyte, Phonolite, etc.
3—Monzonite	3a—Latite, Dacite, etc.
4—Diorite	4a—Andesite, etc.
5—Gabbro	5a—Basalt, Dolerite, trap, etc
6—"Ultra Basics"	6a—Limburgites, augitites, etc.

Notice please that the letter "a" is suffixed to the number if the igneous rock is an finegrained equivalent or a surface flow equivalent of the deep-seated rock. And, in addition to the above second set of numbers a third number, the acquisition number is added. By way of example, the first granite in the collection is 1.1.1. and the first rhyolite or obsidian or pumice is 1.1a.1; the 25th ultra basic is 1.6.25. Even if one has over a hundred specimens of the granites the number on the specimen will not exceed 5 digits, i.e. 1.1.999, and in large collections, as in museums. acquisition numbers are apt to be shown in six digits. As far as conservation of space is concerned, the Bates Geology system is as good as an acquisition system and it furthermore places related rocks in the same cabinet space.

Sedimentary rocks also carry a second number which is perhaps related somewhat to "layer cake" geology and assumes that from the shoreline outward into the area of deposition the order of deposition of sedimentary rocks is No. 1—Conglomerates, No. 2—Sandstones, No. 3—Shales, No. 4—Limestones. And for completeness it adds, No. 5—flints, jaspers, siliceous deposits, etc., No. 6—peats, lignites and coals, and No. 7—chemical precipitates and other sedimentary types not included in the above.

Metamorphic rocks offer more difficulty in subdivision but after the major number No. 3—these divisions may be made:—No. 1 —gneisses, No. 2—schists, No. 3—slates and phyllites, No. 4—marbles, No. 5—serpentines, talcs and ophicalcites, and No. 6—those not included in the above. A more logical and complete outline might be suggested in a subdivision based on foliated and non-foliated types. Nevertheless, the simpler the classification the better it will work in practice. For instance, 2.5.7 is the seventh specimen in our collection of serpentines.

SUMMARY:—All numbers beginning with a 1 are igneous, with a 2, sedimentary, and with a 3 metamorphic; the second number depends on the individual characteristics of the rock within its group; and the third number is merely an acquisition number.

MINERALS

The simplest and easiest method of cataloguing minerals follows the Dana System as shown in the "System of Mineralogy." The highest number used as an index number is in the 800's. If one has 100 specimens of any one mineral the largest classification number will be in six digits. The system needs no further explanation or elaboration.

FOSSILS

Individual collectors normally do not have as large collections of fossils as do the college department, but nevertheless there are many private collectors who have fossil collecting as a hobby. It seems best in this brief paper to present some method of classifying the fossils.

Two main subdivisions are made here. The key numbers used are No. 1—Animals and No. 2—plants. Further subdivision is necessary in both major groups. Any good text in paleontology will give sufficient information as to how to proceed. The Bates College System is as follows:—No. 1 Animals are subdivided as follows:—

No. 1—Protozoa
No. 2—Porifera
No. 3—Coelenterata
No. 4—Vermes
No. 5—Molluscoidea (old classification).
No. 6—Echinodermata
No. 7—Annulata
No. 8—Arthropoda
No. 9—Mollusca
No. 10—Chordata.

But here, as in the rock families a still further subdivision is necessary because of the Classes under each Phyllum. Textbooks must be used to further subdivide but we present here a subdivision of the phyllum Echinodermata, as follows, No. 1—Asteroidea; No. 2—Echinoidea; No. 3—Holothuroidea; No. 4—Crinoidea; No. 5—Cystoidea, and No. 6—Blastoidea. Thus if a collection contains 17 crinoid stems the number of the last one will be 16417. The first star fish would be 1611 and the first trilobite, 1811.

The numerical order of classes under each of the phyllum is entirely arbitrary.

No. 2—Plants are subdivided as follows:—

No. 1—Thallophytes.
No. 2—Bryophytes
No. 3—Pteridophytes
No. 4—Gymnosperms
No. 5—Angiosperms.

A third subdivision is needed again, as in Pteridophytes, No. 23; No. 1—Lycopoda, No. 2—Equisetae, and No. 3—Filicales. The fifth specimen of horsetails would accordingly be No. 3325. (Note—this number might appear as one applied to the slates which are No. 3325, and there will be other analogies in the numbers applied, but the character of the rock, and the collection in which it is filed, will be of determinative value).

LABELING SPECIMENS

The most convenient type of label is the one that fits into a 3 inch by 4 inch box—the type of cardboard tray commonly used in cabinet collections. In the Bates System the number is placed in the upper right hand corner; the name of the mineral on the first line, with two additional lines for notes or statements of varieties; the locality is placed on the fourth and fifth line of the label; and, the name of the donor of the specimen with date of acquisition is placed on the last line. The lines are so arranged that the labels may be typewritten using regular spacing.

NUMBERING THE SPECIMENS

The usual customs in vogue in numbering mineral and rock specimens involve either a small dab of enamel placed on each specimen and the number written thereon in ink, or, the number is placed on a small paper tab which is pasted on the rock or mineral. White enamel with India Ink lettering is preferable because of legibility and visibility. After the ink lettering or numbering has dried a smear of shellac will protect the number and the specimen may be washed without causing smears. If specimens are large the name and locality is best printed directly on the specimen Neat. even edged, small blocks of enamel add considerably to the attractiveness of the collection.

In the Bates College System several different colors of enamel are used. All rocks and minerals from Maine are numbered and labeled on red enamel surfaces. Special collections use other colors of enamel, i.e. we have a collection of some 400 rocks and minerals donated by Wm. E. C. Rich, an alumnus, and this collection carries green enamel; the specimens given us by the Maine Mineralogical and Geological Society carry brown enamel; and, our special collection of crystals is lettered on blue enamel. The main idea of this color classification is based on the sorting out process. In student laboratory work many different minerals and rocks are used. Assistants who put the material back in their proper places can easily identify the collection by means of the color used. And furthermore, a glance at the cabinet displays allow one to pick out all Maine rocks and minerals at a glance.

Some minerals and rocks are extremely porous and it is difficult to obtain an even surface for the enamel. This difficulty is entirely obviated by first making a smooth place about the size of the final dab of enamel on the specimen. Plastic wood (sold in tubes) or modeling clay (that hardens without firing) is excellent for the purpose of smoothing out irregular surfaces.

SPECIAL STUDY COLLECTIONS

It is the ambition of every college and every individual to have complete sets of minerals and rocks from a given locality. Such a collection may be indexed directly with the working collections, as outlined above, or, it may be specially identified An excellent general method that has met with the approval of the students is based on the subdivisions of the quadrangle (or topographic) maps sold by the U. S. Geological Survey. Most of the quadrangles published by the Survey are 15 minute quadrangles—that is, they cover 15 minutes of longitude and latitude. Then by means of 5 minute lines the quadrangles are further subdivided into nine rectangles, as shown in figure 1. Here is the starting point for the number system. The rectangles are numbered as shown in figure 1. (The number is again arbitrary. No reason exists why number 4 should not be under No. 1 except that if the map is folded in the field No. 3 and No. 4 will be adjacent, etc.)

The number as shown in the central part of each rectangle, except the 5th, is the key number.

Each of the rectangles is about 4⅛" by 5⅞" (or miles) depending on the scale of the map. But this area is too big for accurate location of specimens so an additional subdivision is made. Secure a piece of celluloid and divide an area as large as the rectangle area of the map into nine similar divisions are shown by the letter A, B, C and D. Now instead of the above inch measurements of the rectangles, each of these division is only ⅓ the size, or 1.37" by 1.96". But here again our area would be a bit too large for accurate placing. We divide each of the nine new rectangles into nine similar rectangles as a, b, c, d. This brings the size of the spaces down to 0.46" by 0.65". In other words, we have taken the average quadrangle of the region of 45 north latitude and divided it by 27 horizontal lines and 27 vertical lines. The ruled celluloid sheet can easily be carried into the field and used without difficulty. Now, if several different quadrangles are to be used in the study the number might be refixed with the initial letter of the quadrangle, as Lewiston-L, Poland-P. For instance, as rock occurring in the extreme northwest corner of area of Lewiston quadrangle would be L111. Stepping across the line into the Poland quadrangle the rocks in the northeast corner there would then become P333. The fourth number attached to these key numbers is the specimen number or acquisition number. Here again, the system compares favorably with the museum acquisition method for one would hardly expect to collect more than 100 rocks of different kinds from the smallest subdivision which is about 0.5 miles by 0.6 miles. The numbers will seldom approach six digits.

The advantages of this grid method of location are easily seen. Some one describes a rock or a mineral. Most authors are apt to be verbose at the same time that the publisher desires brevity. The description might read: "Tourmalines are found in the pegmatite on the west side of Hedgehog Hill in the town of Peru, Maine." This does not mean much to the man who goes there to search the pegmatite. Hedgehog hill might be a ridge several miles long and its westward slope might be a mile in length It would be easier to rewrite the above and say: "Tourmalines are found in the pegmatite at site 347, Buckfield quadrangle." The searcher is now limited definitely to an area not more than one-half mile each way.

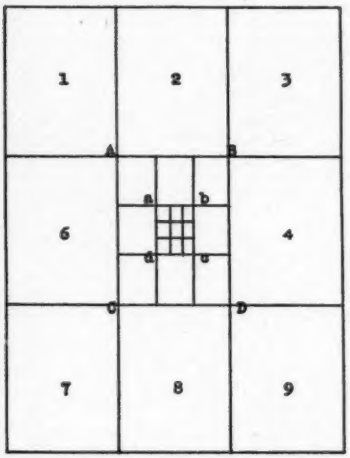


FIG. 1

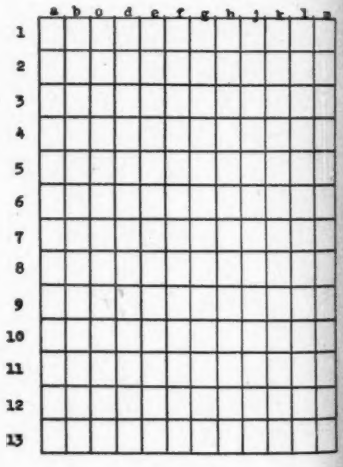


FIG. 2

It will surely be of great advantage to future mineralogists and geologists, and to the geologic sciences as a whole, if people who describe localities would be specific about the locality. Even though one does not care to use the method just outlined of gridding the quadrangle, accurate locations are extremely desirable. Only selfish motives cause one to be very general in described locations.

MODIFICATION OF GRID METHOD

Not all quadrangle maps of the United States show the same linear distance between 15 minute longitude and latitude lines and in order to overcome that difficulty another graph is presented. The writer prefers this second method since it is applicable anywhere, although any collector can make a graph, such as in figure 1, if he bases its divisions on the rectangle size of his particular quadrangle. The second proposal, shown in figure 2, is simple in construction. Vertical and horizontal lines are drawn setting off rectangular or square spaces as the individual prefers. Letters are placed from left to right and numbers are placed vertically. The size of the form is indefinite. Location by this method is easy. Suppose one wants to locate something accurately on a map in one of the southern states. Ascertain the number of the rectangle in the quadrangle by the method of figure 1, and the first number for the specimen is secured. The second and third numbers are then obtained by placing the ruled grid over that particular rectangle, and if the area is located in the extreme northwest corner of rectangle 9, the resulting number is 9a1; extreme southwestern corner of the same rectangle, 9a13; and, in the middle of the eastern margin, 9m7.

If this method is used always place the upper left hand corner of the grid in the upper left hand corner of the rectangle. Allow the east and south sides of the grid to overlap if necessary. By adopting matching of the northern and western limits of the grid a definite universal system may be established.

CONCLUSION

There may be some objections to the number of digits used in any of the systems outlined in this article The entire number will normally have less digits than the acquisition numbers in the large collections. As far as special collections are concerned one could find 999 different rocks or minerals in the smallest subdivision of a quadrangle and still use only six digits, as 168999 The writer will be grateful to those who offer criticisms of the methods outlined above.

And finally, when describing mineral locations one should always keep in mind that some one else might want to see the location. It behooves all of us, for the future of the science, to preserve in the literature the accurate location of deposits described Most of us fulfill this desire unless we are activated only by selfish motives.

HOBBY PARTY IN DETROIT

When the Woman's Association of the North Woodward Congregational Church of Detroit held its annual luncheon in April, the committee in charge called it a Hobby Party. The long tables were each decorated by a hostess who gave a few minutes talk on the hobby that she represented. The touring and camping table was centered by a miniature campsite, woods, stream, tent, and auto. Water sports were presented by a quartette in yachting costumes. The gardening table was elaborately decorated with trellises, packets of garden seeds, and paper-dressed vegetables. Glass collecting was illustrated by a table set entirely with early American glass and dishes. Golf showed up bravely with clubs, balls, tees, costumes, and original poetry. In the center of the bird table was an artificial tree, in which perched tiny bright-colored models of birds.

The Rocks and Minerals table was entrusted to a member of our association. A long narrow dish was filled with beach pebbles covered with water. Around it was built a terrace of the most gorgeously colored rocks she could find. At each end of the center piece there showed the title of the ROCKS and MINERALS MAGAZINE, surrounded by a flat design of rock ferns. Of the two hundred women present only a few had ever thought of rocks other than gem stones as being beautiful, and they had the surprise of their lives.

MRS. A. N. GODDARD, Detroit.

Sand Concretions from California

By S. C. EDWARDS

To what organic form their outline could be traced?—was the point which attracted most attention.

Since the location where they are found near Signal Mountain, quite close to the Mexico-California line is indicated on geological maps as old sea beach, it was easy to asociate the form of the objects with that of the rope-like kelp with globular enlargements.

Among other names suggesting origin, when specimens were shown before the Botanical Club, "Petrified seaweed," "Petrified turnip," "Petrified mushroom" were spontaneous.

Those whose opinions should be worth most call them sand concretions —globular sandstone bodies mostly with stalactite handles.

Just how they are formed, whether in horizontal or vertical positions, opinions vary. If those venturing an opinion on the process of formation had the opportunity to study specimens "in position" as well as after removal, deductions would be more satisfactory.

SAND CONCRETIONS
(Multiples)

In the locality observed, surface of the ground is eroded into rounded knolls with occasional gullies ten feet deep. Some of the knolls are rocky and too hard to admit of probing with a shovel. The only knoll in which we have found the specimens had a covering of a foot or more of coarse gravel and silt.

On the surface were many sandstone bodies either with handles broken off or with no evidence of a handle. Some of these bodies broken open exhibited a nucleus of a pebble, shell or what appeared to be a three parted seed pod. None of the well formed specimens with a handle revealed a nucleus.

On the first visit to the locality, several specimens were collected, having been thrown out by crews of the Highway Department while removing gravel for construction work.

At another time, on which occasion the largest specimens were secured, by probing in a space of about three square yards, fifty specimens were secured at a depth of about a foot. These sandstone balls were four to seven inches through with handles up to twenty inches long. Those totally without handles seemed to be cached by themselves. Then large specimens were excavated without determining whether they were in a vertical or horizontal position.

At a later visit to the field, after probing with shovel, a "vein" was located about a foot down, under a twelve inch layer of gravel and silt. The specimens were in a layer of fine sand of about a foot in thickness—none so large as those secured formerly. These were from one to three inches in diameter with handles that were slim and more frail and up to

twelve inches long. These specimens had to be handled with care.

By delving under them and removing the fine sand with the fingers from below, specimens were obtained entire.

We soon noticed the specimens were in regular order all arranged with handles perfectly parallel and horizontal, points north. It was soon possible to locate the vein some thirty feet distant to the south and at about the same depth as before, specimens arranged parallel with ball end south. We obtained some two hundred.

Nearly all the specimens secured from former trips showed no evidence of stratification while most of the specimens regularly arranged in the fine sand showed on surface of ball and handle lines of stratification. If these stratification lines are taken to indicate formation in a horizontal position, it may be objected that those lines resulted from becoming imbedded later in sand, part of which adhered to the surface of the specimen. However it is further noticed that some specimens exhibit strata of black mica particles through ball and handle. Such strata can hardly be due to having been imbedded at a subsequent date.

Another item about these specimens worth noting is the fact that many of them being multiples, grown together side by side or end to end, have the handles all strictly parallel. If they were formed in a horizontal position as the stratified ones might indicate, why would the handles, double and treble, all be parallel? Or if they were casts after some plant form on the beach or elsewhere, handles would not always be parallel. Some would likely be found with their legs crossed.

Until the last collecting trip on the ground, I had concluded that the specimens were formed in a vertical position, gravity giving direction to the stalactite handles, single and multiple, and then water had carried them along with the other imbedded material to their present position. However any one finding a vein of specimens imbedded in that layer of fine sand, handles arranged with precision, horizontal and parallel, points north, will lose some of his cocksureness concerning the method of formation.

SAND CONCRETIONS
(Singles)

1933-1934

June Bulletin First Year Program

Mineralogy Club Movement for the Youths of the Secondary Schools of America

Conducted by Ben Hur Wilson, 112 Mississippi Ave., Joliet, Ill.

With this issue we close the Program Outlines for the work of the First Club Year. Club Programs on a slightly advanced level, for the work of the Second Club Year, beginning with the opening of schools in September, will be resumed in the August issue.

Active Club work, however, need not necessarily be suspended during the months of July and August, but may proceed, either as usual or in a modified form under the guidance of the Sponsor, or some other competent person, acting as supply, in case of the absence of the regular sponsor during the summer vacation period, in accordance with the desire of the individual club. Most of the summer work, we believe, should be confined to field work and other forms of collecting, rather than to formal programs, as this is far the best time of the year for such endeavors.

Such summer efforts will not only prove profitable, but will likewise serve to hold the Club organization intact until ready for the regular club work to begin again in the fall. This also is a good time for the membership committee to do their recruiting of new members. Special care should be used to select only those who have or will develop a keen and wholesome interest in the subject of mineralogy. It must be remembered that mere numbers do not always make a successful club, and quality should be sought after rather than quantity.

New sponsors, who are organizing Clubs for the first time, will in all probability wish to follow the suggested outlines for the First Year's Work, which have been published in these columns, month by month, during the past year, as these outlines will be found more suited to the work of beginners than the Second Year's Programs, which are to follow. During the summer months these new Sponsors should get out their back numbers of ROCKS and MINERALS, and familiarize themselves with the outlines, making plans for the earlier meetings of the club. In case your subscription does not date back to include the entire set of outlines, Editor Zodac will be able to supply you the missing numbers at the regular price, i.e., thirty cents for the September (quarterly) issue, and ten cents each for the monthly numbers, beginning with the December issue.

Supplementing the work outlined for the First Club Year, completed with this issue, your National Director of Program Building and Research, has prepared in addition to "Bulletins of Information," Series B, No. 1, 2, 3, and 4, announced in the April issue, another Series of one and two page Bulletins designed to assist the Sponsors in the presentation of their work. This material has been so arranged, simplified and condensed, that it may be readily assimulated by students of secondary school age They will prove very helpful, as outlines for study and discussion, and may be best employed by having a sufficient supply on hand that copies may be passed out to each member present at the beginning of the study hour, following which the outlines may be placed in the student's permanent notebook, where it will make excellent material for future reference.

The titles of these Bulletins are as follows*—(all Series A).

No 1—Fundamental Concepts and Defination**s**.

No 2—The Earth Beneath (A Diagram).

No. 3—Classification of Common and Typical Rocks. (Table).

No. 4—Aqueous, Igneous and Metamorphic Rocks. (Notes).

*(n. b.—This list of practical helps will be enlarged and continued in future issues).

No. 5—The Identification of the Common Sedimentary Rocks. (Outline).

No. 6.—Classification of the Common Sedimentary Rocks. (Table).

No. 7—The Identification of Igneous and Metamorphic Rocks. (Outline).

No 8—Classification of Common Igneous Rocks. (Table).

No. 9—Classification of Common Metamorphic Rocks. (Table).

No. 10—Physical Properties of Minerals (An Outline).

No. 11—Key for Physical Determination of Some Common Minerals.

No. 12—Chemical Classification of Minerals. (An outline).

No. 13—The Oxide Star-Graph. (To be colored).

No. 14—The Sulphide Star-Graph. (To be colored).

No. 15—The Carbonate Star-Graph. (To be colored).

No. 16—The Carbon-dioxide Cycle in Nature. (Blank Graph).

*(n. b.—This list of practical helps will be enlarged and continued in future issues).

These Bulletins will be distributed free to Chartered National Club Sponsors, in quantities up to the number of their paid in membership, and to all others, upon receipt of stamps or coins, to cover the nominal cost of mimeographing and postage charges, at the rate of one cent per copy, per Bulletin. Any individual, whether connected with the club movement or not, should feel free to write for copies of this material, inasmuch as it is so planned as to simplify, and make more understandable many phases of mineralogy which are usually considered more or less difficult for the beginner to follow.

For this reason we are anxious to get as wide a distribution on these Bulletins as is possible, and instructors of mineralogy, geology or physiography, either in the secondary schools or colleges, are invited to make such use of this material as they wish, and to work it into their courses in any manner which they see fit. We believe that they will find much of it very practical, and that they may profitably take advantage of the work which is thus being done by the research department of the National Association. Specimen pages will be furnished teachers gratis upon request, and we hope that many will avail themselves of this opportunity of securing satisfactory outline material through this department.

Program Outline: Continued from the May Issue

The Nineteenth Club Meeting

Local Program: A Field Trip to Study Sand

No mineral collection can be complete without a collection of sands. While composed principally of the various forms of quartz, most sand formations contain small quantities of numerous other minerals. Interesting exhibits may be made by filling wide-mouth bottles, of the screw cap variety, with various grades of sand, ranging from the finest flood deposits, through the coarser gravels; and also with sands of different textures, color, and composition.* It may surprise some of our readers to know that some of the finest art work imaginable has been done by colored sand artists, using various natural colored sands so arranged in bottles as to make beautiful pictures and most exquisite designs. This is now almost a lost art, and some of the best examples of the art are valued at hundred of dollars.

One need not go far afield to discover sand deposits along some creek or river, or perhaps imbedded as outwash material in some glacial deposits. Special attention should be given to the origin of each deposit, and many interesting things may be learned by studying the bedding and cross-bedding structure of the deposits. Pictures should be taken of such special features as are noted, and liberal samples secured, packed in paper sacks if dry, or in jars and buckets if wet, later to be distributed, incorporated into and made part of each member's collection. Picks, spades, sieves, and boxes will also come in handy, and should be provided in advance.

In sorting, no bright or colored pebble, especially if clear or transluent, should be overlooked, as practically every variety of the harder gem minerals, have been and might be found in sand and gravel deposits in almost every part of the world. Even diamonds have been found among the glac-

*Such jars may be easily obtained in quantities, as they are widely used in the marketing of salad dressings, peanut butter, mustard, etc. Take advantage of such raw material which has been thrown on the dump.

ial debris of nearly every Central State, which have been brought down and deposited from regions far to the north, by the great ice sheets of the glacial epoch. Perhaps some great "North American Kimberley" yet awaits discovery in the wilds of northern Canada. While this is not considered likely, since it is presumed that such deposits were entirely eroded away by the ice sheets, to find the location of the original source of these gems would make a very nice problem for some club member (future geologist) to work on.

*Such jars may be easily obtained in quantities, as they are widely used in the marketing of salad dressings, peanut butter, mustard, etc. Take advantage of such raw material which has been thrown on the dump.

The Twentieth Club Meeting

National Program: Business Meeting and Study Hour

Program: Part I. Business Meeting

This being the last regular meeting of the First Club Year, this section of the meeting should be conducted with unusual thoroughness, following the regular "Order of Business." A full report of all regular standing committees should be made and such final action as is deemed necessary should be taken on all unfinished business. Under the item, new business, the matter of continuing the club's activities throughout the summer months should be brought up, and after free discussion, the direction or form of these activities should be decided upon, and the necessary committees appointed to carry out the plans agreed upon. At this time the nominating committee for next year's officers should be announced by the president, and if possible a date should be set for the time of the first regular Club meeting beginning the work of the Second Club Year in September.

Part II. The Study Hour

Program Basis: Resume of Work on Sand

1—Remarks by the Sponsor.

2—Reading of "Article of Interest to Mineralogists." Topic:—"Sand." By James H. C. Martens. ROCKS and MINERALS MAGAZINE. March, 1934. Pages 29-31.

3—Reading of "Paper Prepared by Member." Subject: 'The Economic Uses of Sand." (Award Paper National Unified Program Topic).

4—Demonstration by sponsor or visitor. Aim: An understanding of the possible classification of Sands. This talk should include a discussion of the origin, texture, and source material of which sands may be composed, and it should be illustrated with various samples. An explanation of methods of sifting and sorting, and its preparation for the market would also be pertinent.

5—Discussion of points brought out in the Program and the answering of Question Box Queries.

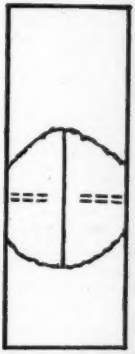
6—Adjournment.

Note:—Mr. Wilson will send free to any Club member, (or others) a sample of what is known as the world's purest quartz glass-makers sand. This sand is of eolian origin and will make beautiful micromounts. Send ten cents to cover cost of packing and mailing, or more if larger quantities are desired.

Second Year Programs are to be continued in the August number.

(SEE LAPIDARY DEPARTMENT On Opposite Page)

Plan—Pins In Place



Plan—Sponges In Place

Don't ever try to put a new saw into a cut made by an old saw. If a saw goes bad during a cut, abandon the cut and start a new one with the new saw or the recharged old one. Don't try to saw with the new saw from the opposite side of the stone to meet the original cut. You will probably wreck the new saw when it meets the old cut.

The Amateur Lapidary

Conducted by J. H. HOWARD*

504 Crescent Ave., Greenville, S. C.

Amateur and professional lapidaries are cordially invited to submit contributions and so make this department of interest to all.

*Author of—*The Working of Semi-Precious Stones.* A practical guide-book written in non-technical language for those who desire to cut and polish semi-precious stones.

MORE ABOUT DIAMOND SAWS

Proper lubrication is necessary. If one has an arbor exclusively for sawing, it is a simple job to put a reservoir above the saw and use a drip system to feed the kerosene to the work. But many of us have only one arbor and must use it for all purposes. When that is the case such a system as mentioned is difficult to work out so as not to interfere with other operations. Especially as we are going to use the diamond saw for many small sawing jobs where we formerly either ground the stone laboriously to shape or broke it approximately to shape or sawed it with carborundum saw.

It is entirely feasible to lubricate the saw with a sponge feed from a reservoir beneath the saw. The scheme is a slight modification of the sponge feed advocated by the writer for grinding wheels. On the grinding wheel the periphery only was to be lubricated. So the sponge was merely fixed beneath the wheel and in contact with it. On the diamond saw the sides are to be lubricated.

Get a pan fairly deep and narrow, say about four inches wide by four inches deep. It can be gotten at the Ten Cent Store. About 1½" from the bottom and about half way between front and rear ends of the pan, solder two sharpened pegs pointed toward each other and with a space of about an inch between the ends. Buy a large regular shaped sponge a little wider than the pan. Determine the position in which it will best lie in the pan. Then split it lengthwise in its center using a sharp knife. Crowd one of the halves between the pegs and push it onto one of the pegs. Then treat the other half the same way having the cut faces together. Lift up the assembly beneath the saw so that the saw projects into the slot in the sponge to within ½" of the bottom of the pan. Slip blocks under the pan to hold it in this position.

Don't forget this; underneath the blocks and the small pan place a large shallow pan. This too, comes from the Ten Cent Store and is about 14"x16"x ½" deep and its purpose is to catch the inevitable spatter. This spatter, when sufficient amount has collected, is to be poured back into the small pan.

When ready to begin sawing, pour kerosene (which should be kept in a large bottle or a coffee pot) thoroughly over both pieces of sponge until it is ¼" or more deep in the small pan. The sponges are well soaked and capillarity and suction caused by the rubbing of the saw against the sponges will keep enough kerosene on the saw.

It is understood that the saw will be largely encircled with a shield slipped over the back of the pan or soldered to it and projecting past the top center of the saw. From the front end of this shield hang a cloth apron that nearly touches the saw. With this scheme you will have proper lubrication as long as there is kerosene standing in the bottom of the small pan and around the sponge and you will not have excessive spatter if you use the shield and the cloth apron, and nearly all the spatter will be caught by the large pan.

Our Junior Club

Conducted by
ILSIEN NATHALIE GAYLORD

Dear Juniors:

June, and vacation almost here. How our collections will grow now, as our sharp eyes search eagerly for specimens on every picnic and camping trip that we take.

Success comes in such unexpected places sometimes. A letter from one of our Club members says that a group of collectors made a trip to a certain rocky spot where they hoped to get some good specimens, but not one did they find of the kind they wanted.

When almost home, however, one of their party suddenly spied a fine specimen—and where do you suppose it was? In the gravel on the road. By some chance that special mineral had been in the gravel pit from which the material was dug for surfacing the road.

More and more fortunate grows our Club box of prizes, for this month not only have the older collectors been generously contributing specimens for our prizes, but some of our Junior Club members also have sent us some fine specimens which they have found.

From Albert Kidwell, of Missouri, has come a box of beautiful little quartz crystals for micro-mounts. These crystals he found in a vein running through some rock on his farm. A letter from him received on this mail says he has just found some curious and unusual limonite and hematite pebbles which he is sending us.

From another Club member has come a package of bright marcasite specimens. With this gift came also the thoughtfully kind offer of seventy-five small specimens for some one of our young Juniors who is just starting a collection and who lives in a poor collecting area. We certainly appreciate such nice gifts, and we want to thank these Club members for taking so kind an interest in their fellow Juniors.

Another most interesting gift has come to us from Mrs. C. A. Carpenter, of Missouri. Among other fine specimens in the package are some "desert roses." We are delighted with these curious formations, and send her a hearty vote of thanks not only for these interesting specimens but for her kind thought in thus helping along our young collectors.

For the Club members who are interested in micro-mounts has come a most generous supply of exquisite little micro-mount specimens. They are from Mr. Thomas Lewis, 6707 Landsdowne Avenue, Philadelphia, Pa. Rich midnight blue azurite crystals, tiny sparkling pyrite cubes, wee ruby red rutile, and many other miniature specimens were in the generous gift from this good friend of our micro-mount collectors. Many thanks we extend to him for his kindness and labor in preparing and sending to us these delicate little specimens.

Our thanks also go to Mr. T. M. Green, of Brothers, Oregon, for some wonderfully interesting and beautiful specimens of agates. Besides various ribbon and banded agates, there were pieces of petrified tree limbs now wholly turned to beautiful blue agate.

From Mr. W. Scott Lewis, of Hollywood, California, has come some very curious and interesting specimens from the Mojave desert and elsewhere. Lastly into our prize box has poured a veritable shower of "Bad Lands" specimens, a gift from Victor Croley of South Dakota. Among these treasures are beautiful pieces of rose quartz, yellow lepidolite, blue-green crysocolla, banded calcite, and many other specimens which will delight our Junior Club prize winners. To each of these good friends also we send our appreciative and grateful thanks.

Now shall we turn to our Club lesson for today, and study some of these interesting specimens which our kind friends have given us?

TWIN ROCKS

Such beautiful specimens we have for our study today! Here is some yellow marble from Sienna, and this red piece is from Algiers These white banded crystals are calcite from our own Bad Lands in South Dakota, and this desert rose was picked up in Oklahoma. So interesting is the history of each one of them!

But we will begin with the twin rocks, limestone and marble. Like the twins sometimes seen in a human family, one quite plain and ordinary and the other a beauty, so it is with these twins in the great family of rocks. Dull white, or gray, or yellow stained is most of the limestone, but not so is the marble. Sparkling snow-white, tawny yellow, soft dove-gray, rich deep red, green, or black are the colors of this beautiful stone. Different indeed!

Yet each was born of the sea, thrust up by great earth upheavals. In the process some of the limestone was terrifically heated, crystallizing it into marble. It is the myriads of crystal faces shining in the sunlight which gives marble its sparkling beauty. Its lovely colors come from the various bits of mineral and vegetable matter in the original limestone In that terrific heat these were liquified and flowed into the fractures and cracks of the marble, making the veins and cloud-like patches of color we so much admire.

Limonite gave that Sienna marble its beautiful yellow shades. From chlorite came some of the green tints, and hematite stained the African marble its deep rich red. Vegetable carbon changed to graphite when touched by the great heat, and to that we owe the soft grays and blacks. One of the finest collections one can make is of these many kinds of beautiful marble.

MAN'S BEST LOVED ROCK

Glistening, snow-white marble! That is man's best loved stone. How do we know this? Because from the most ancient times, whenever possible, he has used white marble for his most precious records and sacred memorials. It is that finest of all white marble, the Carrara, which the great sculptors used for their statues.

Everywhere throughout the Far East are beautiful temples and palaces built of many colored marbles, and lovelier than any other building man has ever made in India's Taj Mahal. Built all of white marble, its glistening white dome seems to float like a beautiful great pearl in the misty pink light of sunrise. Within is a sacred shrine guarded by a solid marble screen, carved through and through like the most delicate and fragile lace. Man's utmost dream of beauty is this exquisite Taj Mahal.

But will it endure, this white marble so beloved by man? Some of it will. While much of it so readily absorbs rain and other moisture, there are certain limited deposits many times more compact than the sturdier granite. It is this marble that man uses for his sacred buildings and loved memorials.

CALCITE

Now about those myriads of sparkling crystals in the marble. They are calcite, and calcite is the second most abundant mineral in the earth's crust. The habits of calcite are so exceedingly curious and so numerous we shall need a whole lesson hour to learn about them. So we will have to leave the main study of calcite for our next meeting. But we have time yet for an experiment or two before our closing.

First we will squeeze some of this lemon juice on this piece of limestone. Do you see it bubble? That is carbon dioxide being freed, the same kind that charges the soda water you enjoy drinking. We could have used hydrochloric acid and the bubbling would have been much more violent and easier to see. But hydrochloric acid is a poison and has to be handled carefully. Our lemon juice although so much slower in action is at least safe.

Now we will drop some of the juice on this marble. Phizz, again! Now some drops on this calcite crystal. It also effervesces. This shows that these minerals which are seemingly so unlike really belong after all to the same family.

Once more the lemon juice, this time upon these little ocean shells. Just as before, phizz! That links our calcite crystals, our marble, and our limestone all back again to their first long-ago home, the sea. It was there, you remember, in far ancient times

that the limestone beds were made from the myriad fallen shells of tiny dead sea creatures.

DESERT ROSES

Curious stony roses these are, some of them found on the far-away Sahara desert and others in our own southwest. In the beginning they must have been red or yellow sand nodules with crystal centers of barite or gypsum. Gradually the wind and rain eroded most of the hard sand, until now the center crystals lying crossed this way and that look fancifully like a partly opened rose. Interesting, indeed, are these little sandy roses among the other specimens in our collections.

AN EXCHANGE LIST

The following members wish to exchange letters or specimens with other members of Our Junior Club.

Paul Zimmer, 2221 Maplewood Avenue, Toledo, Ohio.

Nellie Olson, 41 East Avenue, Saratoga Springs, New York.

Victor Croley, Sanator, South Dakota.

Pat O'Lane, 3859 West 22nd Street, Vancouver, B. C., Canada.

Girard Gallagher, 379 New York Avenue, Jersey City, New Jersey.

THE QUESTION BOX

1. Name the kind and color of rock of which our national Lincoln memorial, and the Tomb of the Unknown Soldier is made.

2. What is the name of the marble used for fine statuary, and from what country does it come?

3. What marble would you choose if you were on a committee to select the kind for making a fine memorial building in your city? Explain why you would use that kind.

4. What kinds of marble would you select for trimmings, such as pillars and a grand stairway, in your memorial building? In what countries would such marbles be obtained in nature?

5. Is limestone a good rock for surfacing? Why?

6. The Great Pyramid of Ghizeh in Egypt is built of limestone blocks which have lasted 6000 years. From this would you consider limestone a durable rock for our public monuments and buildings? Or if not, why not?

Send your answers by July 15th to Our Junior Club, ROCKS and MINERALS, Peekskill, New York.

PRIZES

Three first class prizes will be given for the three best answers to all the questions.

Three second class prizes will be given for the three best answers to any four of the questions.

Three third class prizes will be given for the three best answers to any three of the questions.

With such a full box of fine prizes this month, the winners in this contest will be well repaid by the splendid specimens they win for their collections.

PRIZE WINNERS

The following are the winners of the March prizes, and their prize specimens. A first class prize went to Ruth Schuh, Massachusetts, and her prize was a group of claystone concretions. G. G. Daughenbach, Oregon, won a specimen of Fuchsite. Paul Brown, California, rose quartz. Eugene Goldsby, Washington, chrysoprase. Elbert Parker, North Carolina, rose quartz. Paul Zimmer, Ohio, serpentine. Albert Kidwell, Missouri, lodestone. Ann Wrightington, Massachusetts, sheet mica. Helen Du Pont, New Jersey, rose quartz. Llewellyn Gray, California, rhodonite. Lloyd Felton, Massachusetts, obsidian. Barbara Ewing, Massachusetts, gold ore. Edward Styer, New York, Labradorite. Mildred Kitson, Massachusetts, yellow lepidolite. Ruth Styer, New York, obsidian. Donald Dow, Connecticut, geode. Maurice Prendergast, California, azurite. Margaret Dudziak, New York, chalcopyrite. David Wheeler, Vermont, fossil fern. Pat O'Lane, Canada, meteorite. SECOND CLASS PRIZE, Monroe Farber, Connecticut, red calcite. Ottomar Keinath, Michigan, banded calcite.

Club and Society Notes

Philadelphia Mineralogical Society

President Gillson called to order the regular meeting of the Philadelphia Mineralogical Society, 46 members and 40 visitors being present. The following were elected to membership; Seniors; J. Warren W. Worthington, Martin L. Ehrman and Adolph E. Meier; Juniors: John Anderson, Emile Moraux and George Mershon.

Mr. Harold W. Arndt reported 32 persons in 8 automobies took part in the Field Trip of April 29, visiting Bridgeport, Henderson Station, Howelville and Phoenixville, Pa. Specimens obtained included fine clear Quartz Crystals, some with clear Dolomite and Calcite Crystals mounted on them, Calcite Crystals, Limonite Geodes, Limonite pseudomorph after Pyrite, Graphite, Small colorless Fluorite Crystals, Sphalerite, Galena, Pyromorphite, Wulfenite, Chalcopyrite, Cuprite, Cerussite, Anglesite, Ankerite and Barite.

Mr. David Walker announced that the 40 year old Worrell Mineral collection recently presented to the Frankford Mineralogical Society would be displayed in the Frankford Dispatch window until May 14. Miss E. A. Campbell, President of this Society announced the next meeting for May 28, subject not determined.

Mr. Stephen Varni exhibited the largest and clearest Green Tourmaline crystal ever found at Mt. Mica, Maine. It is uncut, weighs 422 carats, and would cut a flawless stone of 200 carats. He described its finding by Mr. Merrill in the late nineties.

Dr. E. H. Payne described the acquisition of a flawless piece of Citrine Quartz uniform in color weighing 14 ozs., from a native at Oro Prato, Brazil. It would cut a perfect square stone of 10 Ozs., or a pear shaped one of 12 ozs.

Mr. Samuel G. Gordon announced that the big blast at the Prospect Park Quarry, Paterson, N. J., has been postponed indefinitely.

Dr. Edgar T. Wherry moved that a committee be appointed to invite the Pennsylvania Field Conference of Geologists to hold their May, 1935 meeting in or near Philadelphia.

President Gillson directed attention to the exhibit of Mineral specimens mounted on a wooden display panel. which was prepared by Ralph P. Carmer, a young collector.

President Gillson introduced Professor Lincoln Dryden of Bryn Mawr College, who addressed the Society on Rock Correlation by Heavy Minerals. He explained how the source and age of Sedimentary beds could be determined by correlating the minerals having a specific gravity greater than 2.9, contained in the sediments. By this method rocks formed in one drainage basin can be correlated. The most thorough work by this method has been done in the southwestern part of England on the Dartmoor Granite. The advantages of this method are: Heavy Minerals are timeless; Minerals are not world-wide; Each mineral species never changes its identity. The method has been used successfully in connection with the water supply near Triest, also in Oil Field work. Any work which may be done on the heavy minerals of eastern Pennsylvania will be a contribution to Geology.

The Society gave Prof. Dryden a rising vote of thanks for his splendid presentation.

W. H. FLACK, Secretary.

Long Island Mineralogy Club

The first outing of the Long Island Mineralogy Club was held on Sunday, May 5th, at the old Tilly Foster Mine near Brewsters, N. Y. Sixteen members were present and many good specimens were secured. Plans are under way for another trip during the summer and possibly others will follow.

Plans are being made for fall and winter activities of the club and members are looking forward to very inter-

esting talks and demonstrations by members and guests.

The growth of the club has been quite rapid and a larger meeting place is being considered for the fall and winter.

Further information regarding the club and its activities may be had by addressing the sponsor, H. W. H. Stillwell, Rockville Centre, Long Island, N. Y.

Cleveland Gem Society

We take pleasure in announcing the formation on April 5, 1934, of the Cleveland Gem Society. The Society was founded by twenty charter members and the membership is rapidly increasing.

The object of this Society as set forth in its Constitution is:

1. To promote the scientific study of Gems.

2. To provide a means through which those interested in Gems can exchange ideas and experiences; can gain a better understanding of how Gems have been an influence in Art, History, Religion, Literature, and Romance throughout the past ages.

3. To foster a true appreciation for Gems in the minds of the public and to make the public Gem-conscious.

We send to the Rocks and Minerals Association "Greetings" and hope that should any of its members be in this vicinity they will communicate with us and accept the humble hospitality that we can offer them.

H. A. ERICKSON, Sec'y-Treas.
1305 Euclid Ave., Cleveland, Ohio.

Frankford Mineralogical Society

This society, organized a short time ago by a group of young men keenly interested in minerals, boasts of 43 charter members, a constitution and by-laws. It meets on the fourth Monday of each month (excepting July and August when no meetings are held) at 8:00 P. M. in the Frankford Friends Meeting House in Philadelphia, Pa. Each meeting usually has its new business and old business, new applications for membership, reports of publicity, program and trip committees. Of course preceding this and at first is the reading of the minutes of the last meeting by the secretary. The treasurer gives a report every six months. After all of the business has been taken care of, the president presents the speaker for the evening who usually is a professional man familiar with mineralogy or geology.

The society may soon issue monthly pamphlets featuring write-ups on mineralogy by various members.

The meetings of the society are usually announced in the local newspapers which gives them much publicity. Many exhibits of minerals in store windows is another method for obtaining publicity which often results in new members being received, besides inducing many people to attend the meetings.

READERS' SECTION

Hawaii Rocks and Crystals

Editor "R. & M.":

I was struck with a real wave of genuine pleasure yesterday when I found my first copy of your famous magazine waiting for me on my office desk. It did not take me long to literally call a holiday and pour over it, page by page.

Upon reading your first article featuring "Mount Apatite, Maine" I was generally discouraged. Discouraged because a mere year or so ago I myself had been wandering in the vicinity of Taylor Pond, but not, unfortunately, in search of minerals. Since then, I have become quite an ardent collector and specialize in the rocks and crystals of my homeland—Hawaii.

Some day in the near future, I hope to compile a paper of notes taken on my many mineralogical trips through Hawaii. Surprisingly enough, I have found beautiful specimens of orthoclase, moonstone, gypsum, quartz, olivine and two curious minerals that are found only in our fair islands—a "Hawaiian Diamond" (hardness about 9) and Pele's Hair (a most queer formation of a silicate somewhat harder than quartz.

WILLIAM EDWARD CARTWRIGHT
Honolulu, Hawaii.